Evidentiality and temporal distance learning[*]

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Abstract The grammatical category of evidentiality is traditionally defined as marking evidence type or related concepts (Anderson 1986, Willett 1988, Aikhenvald 2004). I argue against this received view as I show that evidential morphemes in Bulgarian mark the temporal distance between the time at which the speaker learned the described proposition and the topic time. I also demonstrate that Bulgarian evidentials represent projective/backgrounded content that is informative but does not affect the described proposition, which is plainly entailed. The latter fact especially has important typological and theoretical consequences. The proposal is formalized in a logic that extends Dynamic Predicate Logic by adding propositional variables (cf. AnderBois et al. 2010).

Keywords: evidentiality, temporality, projective/backgrounded content

1 Introduction

The Bulgarian language exhibits a morphological distinction between direct and indirect evidential marking, as illustrated in (1)-(3) below. Sentences with indirect evidentials show a further morphological variation when occurring in the third person (singular or plural): a reduced and a full present perfect form. The reduced form lacks an auxiliary and typically gives rise to reportative readings (2). The full form includes the auxiliary and typically receives inferential interpretations (3).[1]

(1) *Ivan celu-n-a-Ø   Maria.*
     Ivan kiss-PFV-3SG.PST-**DIR** Maria

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[1] In the glosses the following abbreviations are used: 1/2/3 = first/second/third person, DEF = definite article, DIR = direct evidential, FEM = feminine, FUT = future, IND = indirect evidential, NEG = negation, NEUT = neuter, PFV = perfective, PL = plural, PRES = present, PRT = particle, PST = past, SG = singular.

'(I saw that) Ivan kissed Maria.'

(2) *Ivan celu-n-a-**l**   Maria.*
Ivan kiss-PFV-3SG.PST-**IND** Maria

'(I was told that) Ivan kissed Maria.'

(3) *Ivan e   celu-n-a-**l**   Maria.*
Ivan be.3SG.PRES kiss-PFV-3SG.PST-**IND** Maria

'(I infer that) Ivan kissed Maria.'

In this paper I focus on the meaning contrast in (1)-(2).[2] More generally, I discuss the direct evidential, a null verbal suffix represented as *-Ø* (DIR), and the indirect evidential, the *-l* (IND) verbal suffix, when it occurs in the reduced present perfect form.

The rough intuition, reflected in the preliminary translations above, is that DIR signals direct perceptual evidence for the described event whereas IND signals indirect (i.e. reportative or inferential) evidence for the described event. Below, I demonstrate that this intuition is not entirely accurate. Instead, I argue for a temporal account according to which Bulgarian evidentials impose restrictions on the time frame during which the expressed proposition was learned by the speaker.

The proposal has three parts. First, it is argued that Bulgarian sentences with evidentials entail their scope proposition.[3] For example, both (1) and (2) entail that Ivan kissed Maria. This is different from other evidential systems in which indirect evidentials do affect the scope proposition, e.g. by making a modal claim about it (as in St'át'imcets'; see Matthewson et al. 2007) or by simply presenting it (as in Cuzco Quechua; see Faller 2002). Second, I propose that Bulgarian evidentials represent projective meanings that constitute backgrounded assertions. For example, the evidential contribution of IND in (2) cannot take scope under truth-conditional operators and is not part of the main point of the utterance. This goes against the widespread claim that evidentials in Bulgarian (as well as other languages) contribute presuppositions of evidence type (see Izvorski 1997 and Sauerland & Schenner 2007). Finally, I argue that Bulgarian evidentials are 'secondary tense' morphemes which express a temporal relation between a past learning event/secondary 'now' and the topic time. More precisely, I claim that DIR (secondary non-past) indicates that the speaker learned the scope proposition *before* or *during* the topic time whereas IND (secondary past) signals that the speaker learned the scope proposition *after* the topic time. For example, during a discussion about the party last night, uttering

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[2] I leave the analysis of the full present perfect form for further research. Ideally, the inferential readings should be compositionally derived from the independently motivated meanings of IND and the present auxiliary.

[3] The 'scope proposition' is the proposition expressed by the non-evidential part of the sentence. I adopt this terminology from Murray (2010).

(1) would imply that the speaker learned that Ivan kissed Maria during the party whereas (2) would imply that the speaker learned that Ivan kissed Maria after the party was over. The temporal part of the proposal does away with 'evidence type' as a primitive notion and puts Bulgarian evidentials in line with temporal evidentials in other languages (see Nikolaeva 1999, Aikhenvald 2004, Fleck 2007, Lee 2008, Speas 2010).

The paper is structured as follows. Section 2 discusses the strength of the scope proposition in sentences with evidentials. Section 3 analyzes the status of the evidential meaning. The temporal account is developed in Section 4. Section 5 provides a formal implementation. In Section 6, the account is tentatively extended to sentences in non-past tenses. Section 7 concludes and discusses some broader implications of the proposal.

2   The status of the scope proposition

In this section I argue that Bulgarian sentences with (indirect) evidentials entail the scope proposition. The intuition that indirect evidentials in some languages do not affect the scope proposition has already been discussed elsewhere in the literature; see Nikolaeva (1999) for Northern Ostyak, Garrett (2001) for Tibetan, Sauerland & Schenner (2007) for Bulgarian, and Lim (2010) for Korean. However, the idea has not been given enough emphasis and its theoretical and typological implications have not been further explored.

Izvorski (1997) famously analyzed the Bulgarian indirect evidential as an epistemic necessity modal which also carries the presupposition of indirect evidence type.[4] According to this view, the sentence in (2) above asserts that Ivan must have kissed Maria and presupposes that the speaker has indirect evidence for her assertion. On fairly standard assumptions about the semantics of necessity modals (e.g. Kratzer 1991), this would imply that a speaker uttering a sentence with IND considers the scope proposition to be highly likely but the speaker is not fully committed to its truth. To argue against this view, I will compare the epistemic uses of *trjabva* 'must'/'should', the only necessity modal in Bulgarian, to IND and demonstrate that only the latter entails the proposition in its scope.

The first piece of evidence comes from modal subordination (see Roberts 1989). Indefinite objects in the scope of *trjabva* are not entailed and cannot be referred to anaphorically from outside the modal environment. In contrast, indefinite objects in the scope of IND are entailed and can be freely referred to in later discourse. For example, (4a)+(4c) cannot be uttered about someone who I have strong reasons to believe is Ivan's girlfriend and with whom I had coffee yesterday. In contrast, if Ivan

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4 See Faller (2006), Faller (2011), McCready & Ogata (2007), Matthewson et al. (2007), Lee (2008), Matthewson (2010), and Peterson (2010) for modal accounts of indirect evidentials in other languages.

introduced his new girlfriend to me and I had coffee with her, (4b)+(4c) would be fully acceptable as a way to report what happened yesterday.[5]

(4)   a. *Ivan **trjabva**-Ø da ima nova prijatelka.*
         Ivan **must**-DIR PRT have new girlfriend

         'Ivan must have a new girlfriend.'

     b. *Ivan ima-**l**   nova prijatelka.*
        Ivan have-**IND** new girlfriend

        'Ivan has a new girlfriend, as I learned later.'

     c. *Včera   pix-me-Ø   kafe s   neja.*
        yesterday drink-1PL.PST-DIR coffee with her

        'Yesterday we had coffee together.'

Another piece of evidence comes from the relative ease with which the scope proposition can be denied or doubted by the speaker. There are contexts in which the scope proposition (also known as the 'prejacent') of necessity modals can be explicitly denied by the speaker. However, in similar contexts it is not possible for the speaker to deny the scope proposition of evidentials. Imagine that the barometer is showing the highest possible chance of rain but the speaker checks the weather outside and finds no trace of rain. She could report this by uttering (5a). Now consider another situation: the speaker is informed on the phone that it is raining outside but she also looks through the window and sees the bright sunshine. It would not be acceptable for her to report this situation by uttering (5b).

(5)   a. *V moment-a   **trjabva**-Ø da val-i,   no ne val-i-Ø.*
         in moment-DEF **must**-DIR PRT rain-3SG but NEG rain-3SG-DIR

         'It should be raining right now, but it isn't raining.'

     b. *#V moment-a   val-ja-**l**-o,   no ne val-i-Ø.*
        in   moment-DEF rain-3SG-**IND**-NEUT but NEG rain-3SG-DIR

Similar judgments are obtained with weaker denials, e.g. by adding *maj* 'it seems' to the second conjunct in (5a)-(5b).

The fact that IND does not trigger modal subordination effects and that its scope cannot be denied or doubted by the speaker are straightforwardly explained by the assumption that sentences with IND plainly entail the scope proposition. From this it seems to follow that IND is not a modal element. However, one might object that the same facts would also follow if IND were a necessity modal, albeit a strong one. Von Fintel & Gillies (2010) argue that English sentences with *must*, a strong

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necessity modal, do entail the scope proposition. Thus, if *trjabva* is a weak necessity modal but IND is a strong necessity modal, the contrast in strength between the two elements would follow.

To show that IND is not a (strong) necessity modal, I compare its behavior in contexts in which it strengthens a previously made modal claim. One could distinguish between 'modal strengthening', i.e. a strengthening from a weaker to a stronger modal claim, and 'absolute strengthening', i.e. a strengthening from a modal claim to the plain assertion. (6a) is a case of modal strengthening and (6b) is a case of absolute strengthening. What is important is that the adverbs signaling the shift in degree of certainty differ in the two cases: *vsyštnost* 'in fact' in (6a) vs. *naistina* 'indeed' in (6b). Crucially, when a sentence with *trjabva* is strengthened to a sentence with IND, *naistina* is strongly preferred, indicating that (6c) is a case of absolute strengthening, not of modal strengthening.

(6)   a. *Dnes može-Ø   da val-i.   **Vsyštnost** / #I **naistina**, dnes trjabva-Ø*
today might-DIR PRT rain-3SG **in.fact**   / and **indeed**   today must-DIR
da val-i.
PRT rain-3SG

'It could rain today. In fact, it must rain today.'

b. *Dnes trjabva-še-Ø da val-i.   ??**Vsyštnost** / I   **naistina**, dnes*
today might-DIR   PRT rain-3SG **in.fact**   / and **indeed**   today
val-ja-Ø.
rain-3SG.PST-DIR

'It should have rained today. And indeed, it rained.'

c. *Dnes trjabva-še-Ø da val-i.   ??**Vsyštnost** / I   **naistina**, dnes*
today might-DIR   PRT rain-3SG **in.fact**   / and **indeed**   today
*val-ja-**l**-o.*
rain-3SG-**IND**-NEUT

'It should have rained today. And indeed, it rained, as I learned later.'

I conclude that Bulgarian sentences with indirect (as well as direct) evidentials plainly entail the scope proposition. If this is on the right track, it would argue against Bulgarian evidentials being either of the two more familiar types of evidentials: modal-like evidentials (e.g. *ku7* in St'át'imcets'; see Matthewson et al. 2007) or illocutionary-like evidentials (e.g. *-si* in Cuzco Quechua; see Faller 2002).[6]

It should be emphasized that a sentence with IND does not always entail the scope proposition. The speaker has various tools at her disposal in case she chooses

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6 The names 'modal-like' and 'illocutionary-like' evidentials are not meant to imply a particular analysis but are rather a descriptive way of referring to evidentials with different degree of the speaker's commitment to the scope proposition.

to make a weaker claim: e.g. she could add extra intonation indicating uncertainty or disbelief, use the dubitative mood,[7] or include adverbs like *už* 'allegedly'. Either of those strategies would make, say, the sentence in (5b) felicitous. However, with the exception of the dubitative mood, such weakening strategies are independent of the evidentiality system and are also found in languages without grammatical evidential marking, including English.

3   The evidential import as projective/backgrounded content

In this section I argue that Bulgarian evidentials represent projective meanings that constitute backgrounded assertions. The idea that the evidential signal is in some sense 'secondary' to the main assertion has been hinted at elsewhere in the literature (see Anderson 1986 and Nikolaeva 1999) and has been given a full-blown defense in Murray (2010). (See also Lim 2010, who analyzes the evidential signal as, roughly, an informative presupposition.)

'Projection' and 'backgroundedness' are two closely related but distinct concepts. Projection is the semantic property of not being able to be interpreted in the scope of truth-conditional operators. This property is typically a matter of grammatical status, i.e. of having a particular lexical meaning or exhibiting a particular syntactic structure. Backgroundedness (often referred to as being 'not at-issue') is the pragmatic property of not being part of the main point of the utterance. This property is a matter of lacking salience in discourse. The prime example fitting both concepts is that of presupposition. More recently though, researchers have focused on a large class of meanings that both project and are backgrounded but do not contribute (classical) presuppositions, incl. appositives, expressive adjectives, and honorifics (see Chierchia & McConnell-Ginet 1990, Potts 2005, Simons et al. 2010). Following up on Murray (2010), I argue that Bulgarian evidentials are both projective and backgrounded content that is not presuppositional.

I first discuss the projective nature of Bulgarian evidentials. It is easy to notice that IND cannot take scope under truth-conditional operators like negation. In (7) the negation cannot take scope over the evidential import but only over the regular assertive content.

(7)   *Ivan **ne**   celu-n-a-**l**   Maria.*
      Ivan **NEG** kiss-PFV-3SG.PST-**IND** Maria

      'Ivan didn't kiss Maria, as I learned later.'
      NOT: 'I didn't learn that Ivan kissed Maria.'

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7 The dubitative mood in Bulgarian has the full present perfect morphology but also marks the auxiliary with the indirect evidential.

Data like these have led researchers to assume that the indirect evidential contributes presuppositional content (e.g. Izvorski 1997, Sauerland & Schenner 2007). However, the projective behavior of IND seems to differ from that of classical presuppositions. Ever since Karttunen (1973) it has been known that classical presuppositions are 'plugged' when asserted in conditional antecedents, as in 'If Jack has children, then *all of Jack's children* are bald' or when occurring under verbs of saying, as in 'Jack said that Fred kissed Cecilia *again*'. Unfortunately, the reduced present perfect form of IND cannot occur in conditional antecedents. But it can occur under verbs of saying and in such cases the evidential almost always retains its speaker-orientation (see Sauerland & Schenner 2007). Imagine that Maria sees Todor's hair and tells the speaker that Todor has red hair. Since the speaker only has reportative evidence, she would preferably utter (8), marked with IND in the embedded clause. Compare this to a situation in which Milena sees Todor's hair and tells Maria that Todor has red hair. Maria reports this to the speaker, who however has already seen Todor's red hair. In such a situation the embedded clause needs to be marked by DIR.[8] [9]

(8)   *Maria kaz-a-Ø*   *če Todor ima-Ø*   / *ima-l*   *červena kosa.*
       Maria say-3SG.PST-**DIR** that Todor have-**DIR** / have-**IND** red   hair

       'Maria said that Todor has red hair.' (Sauerland & Schenner 2007)

Such data suggest that IND represents projective meaning that is not presuppositional.[10]

     Next, I discuss the backgrounded nature of Bulgarian evidentials. A hallmark of backgrounded content is the fact that its truth cannot be directly challenged in subsequent discourse. Content contributed by indirect evidentials passes this test for backgroundedness. For example, (9) below cannot be offered as a reply to (2), translated as 'Ivan kissed Maria, as I learned later'.

(9)   *Tova ne*   *e-Ø*   *vjarno. Ti*   *go na-uč-i-Ø*   *ošte*
       this   NEG be.3SG.PRES-DIR true   you it   PFV-learn-3SG-DIR already
       togava.
       then

       'That's not true. You learned it already at that time.'

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8 In this latter case the speaker has both direct and indirect evidence for the embedded clause. It is not immediately clear why DIR is preferred over IND in such contexts.

9 Neither version of (8) would be used if the speaker disbelieves the embedded proposition. In the latter case only the dubitative mood seems possible. (I thank Chris Kennedy and Sarah Murray for bringing up this point.)

10 One notable exception to the speaker-orientation of evidentials is the so-called 'interrogative flip' (Garrett 2001, Lim 2010, Murray 2010). In questions, evidentials *presuppose* that the hearer has the relevant information to answer the question.

Evidentials share the property of being backgrounded with presuppositions. However, there are at least two important ways in which evidentials differ from presuppositions. First, as Faller (2002) points out, the information contributed by evidentials is discourse-new, whereas the information contributed by presuppositions is discourse-old. Presuppositions can only exceptionally present new information, a move that is accompanied by a special discourse effect, that of accommodation. To say that evidentials are presuppositions that typically accommodate would be to make the exception the rule. Second, Lim (2010) observes that presuppositional implications which are not met have a different semantic impact than evidential implications which do not hold. When presuppositional implications are false, the intuition is that the discourse has become defective and needs to be repaired. In contrast, when the wrong evidential is used, the intuition is not that the sentence is infelicitous but rather that the speaker is lying or being deceitful. Given these two general considerations, I tentatively assume that Bulgarian evidentials contribute projective/backgrounded content that is not presuppositional.[11]

Both the fact that the scope proposition is entailed, argued in Section 2, and that the evidential contribution projects/is backgrounded, argued in the current section, are captured in the formal part of the proposal by separating the meaning impact of regular assertive content from that of evidentials. Regular assertive content is predicated of the topical worlds that are currently under discussion and will affect the context set only if accepted by the speech participants. This holds whether or not the particular language has evidential marking. In contrast, evidential content directly updates the current context set and thus is not up for negotiation.

4 Evidentiality and temporal distance

Having discussed the meaning contributions of the scope proposition and the evidential, I now come to the most substantial part of the proposal: the content of the evidential meaning. I argue that Bulgarian evidentials are 'secondary tense' morphemes which represent a temporal relation between a past learning event/a secondary 'now' and the topic time. DIR signals that the speaker learned the scope proposition *before* or *during* the topic time while IND signals that the speaker learned the scope proposition *after* the topic time. Thus, DIR can be thought of as a (secondary) non-past marker and IND can be thought of as a (secondary) past marker.

The current account is quite a radical departure from standard theories of eviden-

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11 Since Bulgarian evidentials do not affect the scope proposition, they could just as well be called 'conventional implicatures', in the sense of Potts (2005). However, doing so would also make them a different meaning type from (indirect) evidentials in languages like Cuzco Quechua (see Faller 2002) or Cheyenne (see Murray 2010) which clearly affect the scope proposition and thus cannot be conventional implicatures in this sense.

tiality. Traditionally, the grammatical category of evidentiality is defined as denoting 'evidence type' or related concepts, e.g. 'indication of evidence' (Anderson 1986), 'information source' (Willett 1988), or 'source of information' (Aikhenvald 2004). On the current account the notion of 'evidence type' plays no theoretical role but is derived from the temporal position of the time of learning with respect to other parts in the temporal structure. Simply put, evidentiality in Bulgarian signals *when*, not how the scope proposition was learned. Learning events (or situations) have been claimed to play a crucial role in the evidentiality systems of other languages too, e.g. in Northern Ostyak (Nikolaeva 1999), Tariana (Aikhenvald 2004), Matses (Fleck 2007), Korean (Lee 2008), various languages (Speas 2010). The current account lends further support to the aforementioned analyses.

Before going into the discussion, I provide some background on temporality. I assume a neo-Reichenbachian temporal ontology consisting of a *speech event*, a *verbal event*, and a *topic time* (also commonly called 'reference time').[12] The speech event is the event of the speaker's uttering the sentence; the verbal event is the event (or, more broadly, the eventuality) described by the sentence; the topic time is the time to which the claim of the sentence is limited. Temporal adverbials mark the topic time. Tense is a relation between the speech event and the topic time while aspect is a relation between the topic time and the event time.[13] I enrich this fairly standard temporal picture by introducing a *learning event*, i.e. the event of the speaker's learning the scope proposition.

Given this temporal ontology, the two core sentences with evidentials in (1)-(2), repeated below as (10)-(11), will receive the analysis pictorially represented below, where e_s = speech event, e = verbal event, t = topic time, e_l = learning event.

(10)   *Ivan celu-n-a-Ø*   *Maria.*
       Ivan kiss-PFV-3SG.PST-**DIR** Maria

       'Ivan kissed Maria, as I learned then.'

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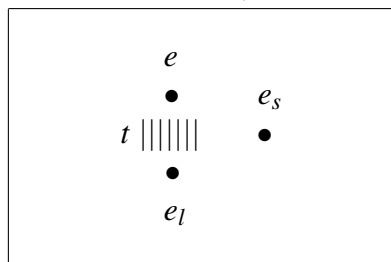
12 I prefer to conceive of the first two as events, not as times, for two reasons mainly. First, the presence of a speech event enables us to easily derive related notions such as 'speaker' (the agent of the speech event), 'hearer' (the patient of the speech event), etc. Also, introducing a speech event, a verbal event and a learning event emphasizes certain configurational similarities across empirical domains (see Conclusion for more on this point).

13 See Dowty (1986), Kamp & Reyle (1993) and Klein (1994) for a fuller discussion of these notions.

(11) *Ivan celu-n-a-**l**   Maria.*
      Ivan kiss-PFV-3SG.PST-**IND** Maria

'Ivan kissed Maria, as I learned later.'
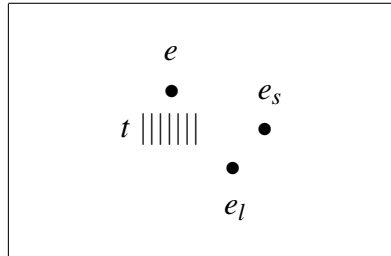
Since both sentences are marked for past tense, the topic time precedes the speech event in each case. These sentences are also marked with the perfective aspect, hence the verbal event is included in the topic time. The only point of difference between the two sentences is where the learning event is located: during the topic time (10) or after the topic time (11).[14]

The temporal account may not seem very different from the received view, according to which DIR and IND signal direct or indirect evidence type, respectively. However, there are two types of examples in which the two views make different predictions and thus can be distinguished. The first type of example includes cases in which the speaker does not witness the verbal event but the topic time includes the learning event. Consider (12). When the topic time, made explicit by the temporal adverbial, fully precedes the learning event, only IND is possible (12a). This is as expected on both the temporal account and the received view—according to the latter, due to the indirect nature of the evidence. More strikingly though, when the topic time is made bigger and includes the learning event, DIR is strongly preferred (12b), as predicted by the temporal account.

(12) On Saturday morning Jack goes to New York. You learn about it on Saturday afternoon, say from a mutual friend. A few days later you say:

a. *V sybota   sutrin-ta   Džak #oti-de-**Ø**   / oti-šy-**l**   do NY.*
   on Saturday morning-DEF Jack go-3SG.PST-**DIR** / go-PST-**IND** to NY

'On Saturday morning Jack went to New York, as I learned later.'

b. *V sybota   Džak oti-de-**Ø**   / ??oti-šy-**l**   do NY.*
   on Saturday Jack go-3SG.PST-**DIR** / go-PST-**IND** to NY

'On Saturday Jack went to New York, as I learned then.'

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14 The direct evidential seems also compatible with the learning event preceding the topic time; see example (14).

Notice that the speaker has indirect (more precisely, reportative) evidence for her claim in both (12a) and (12b), so recourse to 'evidence type' alone will not do here.

The second interesting type of example arises in cases in which the speaker witnesses the verbal event but realizes what she has seen at a later time which excludes the topic time. The temporal account correctly predicts that in such cases IND is required. In (13) the whole narrative is marked with the direct evidential but when it comes to describing what President Nixon was doing in his office, only the indirect evidential is possible.

(13)   One of Nixon's aids vividly recalls walking into the President's office and seeing the President erase some tapes. A few months later she learns about the Watergate scandal from the newspapers and makes sense of what she has seen. When asked what happened *on that day*, she says:

   a. *Kogato vljaz-ox-Ø,*   *Niskyn tri-e-še-Ø*   *njakav-i zapis-i.*
      when   enter-1SG.PST-DIR Nixon erase-3SG-PST-DIR some-PL tape-PL

      'When I walked in, I saw Nixon erase some tapes.'

   b. *A   toj #zalič-ava-še-Ø*   *| zalič-ava-l*   *ulik-i-te.*
      but he remove-3SG-PST-**DIR** / remove-3SG-**IND** clue-PL-DEF.PL

      'He was covering up the clues, as I learned later.'

Again, this example cannot be explained in terms of 'evidence type': the speaker has direct evidence for (13b) but has to report it with the indirect evidential.[15]

There are at least two significant consequences of the discussion so far. First, it is clear that the knowledge involved is *propositional*, not eventive. Bulgarian evidentials encode when the scope proposition was learned, not whether the speaker perceived the verbal event or not. Second, the learning event is linked to the *topic time*, not directly to the verbal event. This is particularly clear when Bulgarian evidentials occur in negative sentences as in (7), which deny the existence of the verbal event but still have a topic time. Those two consequences disqualify alternative event-level analyses of temporal evidentials which link the speaker's perception directly to the verbal event (e.g. Faller 2004, Chung 2007).

I close this section with a few broader remarks on the temporal account presented above. First, I assume that the learning event always precedes the speech event, independently of whether the topic time is in the past (as in all of the above examples), in the present or in the future (see Section 6 on the latter cases). This is

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15 Aikhenvald (2004) refers to such cases as 'deferred realization' and links them to mirative uses of evidentials. Since mirative readings are typically marked by indirect evidentials/past tenses, the puzzling nature of (13b) would be explained. However, (13b) does not seem to have the typical attributes of mirativity: it can be uttered with a declarative intonation and the speaker could already be aware of the content of her report.

a plausible component of the evidential meaning as the speaker could felicitously make an assertion only if she has acquired the asserted content in the past.

Next, the direct evidential is analyzed as a secondary *non-past* tense, not as a secondary present tense. This choice is motivated by cases in which the learning event precedes the topic time, and in which what is required is the direct evidential.

(14)   Two days ago your colleague Ivan calls you and tells you that he is very sick and will skip work the next day. As expected, yesterday he does not show up for work. Today you say:

   Včera   Ivan beš-e-Ø   / #bi-l   bolen.
   yesterday Ivan be.PST-3SG-**DIR** / be.PST-**IND** sick

   'Yesterday Ivan was sick, as I learned before that.'

Hence, I assume that the direct evidential is underspecified between a present and a past learning event with respect to the topic time.

The third point concerns the status of the direct evidential, analyzed here as a phonologically null suffix. What about the possibility that DIR is not real and that the direct evidential readings arise as a conversational implicature?[16] Such a view would predict that the unmarked structure is also compatible with the learning event following the topic time, a prediction that is not borne out.

(15)   *#Včera   Ivan kup-i   nova kola, kakto na-uč-ix   dnes.*
   yesterday Ivan buy-3SG.PST new car   as   PFV-learn-1SG.PST today
   'Yesterday Ivan bought a new car, as I learned today.' (targeted)

Finally, learning events seem to play some limited role even in English. There are cases in which the verbal tense targets the learning event, not the verbal event. In (16a), the past tense in the second clause does not target some past topic time during which John's blood type was A-positive but rather the time at which the speaker learned that John's blood type is A-positive. In (16b), the future tense does not target some future topic time during which John will be in bed but rather the (possible) future learning event of the hearer's walking into John's room and finding him in bed.

(16)   a. John's blood was drawn and tested a few weeks ago and his blood type **was** A-positive. (Anna Szabolcsi via Ezra Keshet, p.c.)

   b. It's 8 p.m. and John **will** be in bed. (Anna Szabolcsi via Ezra Keshet, p.c.)

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16 If we assume that Bulgarian evidentials are conventional implicatures (Potts 2005), then the implications triggered by the use of the unmarked form could be called 'anti-conventional implicatures'. See Percus (2006) for the related notion of 'anti-presupposition'.

The fact that learning events are also part of temporal systems of languages without grammatical evidential marking lends further support for the current account.

5   Formal account

Following the seminal work of Stalnaker (1978), several scholars have emphasized the idea that (at-issue) assertion is not a direct update of the context set but rather a *proposal* to update the context set (e.g. Groenendijk & Roelofsen 2009, Farkas & Bruce 2010, Murray 2010). AnderBois et al. (2010) propose to capture the distinction between regular assertive content and assertive content contributed by appositive by the different ways assertive content can enter the context set. Regular assertive content is a proposal to update the context set whereas appositive content is directly 'imposed' on the context set. AnderBois et al. (2010) implement this idea in a logic that extends Dynamic Predicate Logic (Groenendijk & Stokhof 1991) by adding propositional variables. Since Bulgarian evidentials share several properties with appositive content—both meanings project and are backgrounded, neither meaning affects the regular assertive content—I adopt their proposal, with slight modifications.

The major innovation of AnderBois et al. (2010) is the introduction of propositional variables, interpreted as non-empty sets of worlds. This requires a model structure that consists not only of a set of individuals D and an interpretation function $[\![\cdot]\!]$ but also a set of worlds W, disjoint from D. There are two important propositional variables in the language: p^{cs} (the current context set) and p (the scope proposition representing the at-issue proposal). Atomic formulas representing lexical relations are relativized to propositional variables by means of the following interpretation rule.

(17) $g[\![R_p(x_1,...,x_n)]\!]h$ iff $g = h \ \& \ \forall w \in h(p) : (h(x_1),...,h(x_n)) \in [\![R]\!]^w$

In short, atomic formulas test whether the described lexical relation holds in every world of the proposition to which the formula is relativized.

A sentence with an appositive as in (18) will be translated as shown below.[17]

(18)   Lance, a cyclist, won.

    a. (*new proposal*) $\exists p \wedge p \subseteq p^{cs} \wedge$

    b. (*assertive content*) $\exists x \wedge x = lance \wedge cyclist_{p^{cs}}(x) \wedge won_p(x) \wedge$

    c. (*acceptance*) $\exists p^{cs} \wedge p^{cs} = p$

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17 I follow AnderBois et al. (2010) in representing random assignment to variables as separate formulas, not as part of first-order quantified formulas as in the seminal work of Groenendijk & Stokhof (1991).

There are three important parts in the translation above (names slightly modified): *new proposal*, *assertive content*, and *acceptance*. In the new proposal part, the scope proposition is introduced as a subset of the current context set, which is anaphorically linked to previous discourse. In the assertive content part, the descriptive part of the sentence is presented. Importantly, regular assertive content is relativized to the proposal proposition p whereas appositive content is relativized to the current context set p^{cs} and directly affects it. Finally, in the acceptance part the scope proposition is accepted by reintroducing the context set variable and equating it with the scope proposition.[18] The difference between regular assertive content and appositive content is in how they affect the context set. Regular assertive content is an update proposal which can be accepted or rejected by the speech participants.[19] Appositive content is backgrounded and directly restricts the context set, regardless of whether or not the new proposal is accepted.

With this formal background in mind, we can translate example (1), repeated below as (19), as follows.[20]

(19)   *Ivan celu-n-a-Ø*   *Maria.*
       Ivan kiss-PFV-3SG.PST-**DIR** Maria

       'Ivan kissed Maria, as I learned then.'

   a. $\exists p \wedge p \subseteq p^{cs} \wedge$

   b. $\exists x \wedge x = ivan \wedge \exists y \wedge y = maria \wedge \exists e \wedge kiss_p(e,x,y) \wedge e \subseteq t \wedge t < e_s \wedge$

   c. $\exists e_l \wedge \text{LEARN}_{p^{cs}}(e_l, \text{AGENT}(e_s), p) \wedge \underline{e_l \leq t} \wedge e_l < e_s \wedge$

   d. $\exists p^{cs} \wedge p^{cs} = p$

The new proposal introduces the scope proposition (19a). The foregrounded part of the sentence asserts that in all worlds of the scope proposition Ivan kissed Maria during some past topic time (19b). The evidential import is represented in (19c). This part of the translation requires that the speaker learn the scope proposition in all worlds of the incoming context set and that the learning event be no later than the topic time and before the speech event. If the proposal is accepted, the scope proposition becomes the new context set by means of (19d).

The sentence in (2), which I repeat below as (20), will receive an almost identical translation, with the only difference that in the third line the learning event has to

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18 Since the scope proposition was introduced as a subset of the old context set, the new context set will also be a (not necessarily proper) subset of the old context set.

19 Rejecting the proposal proposition can be formally achieved by removing the acceptance part from the logical translation of the sentence.

20 I assume that the speech event and the topic time variables are anaphorically linked to previous discourse.

follow the topic time. (The points of difference between the two translations are underlined.)

(20) *Ivan celu-n-a-**l*** *Maria.*
Ivan kiss-PFV-3SG.PST-**IND** Maria
'Ivan kissed Maria, as I learned later.'

a. $\exists p \wedge p \subseteq p^{cs} \wedge$

b. $\exists x \wedge x = ivan \wedge \exists y \wedge y = maria \wedge \exists e \wedge kiss_p(e,x,y) \wedge e \subseteq t \wedge t < e_s \wedge$

c. $\exists e_l \wedge \text{LEARN}_{p^{cs}}(e_l, \text{AGENT}(e_s), p) \wedge \underline{t < e_l} \wedge e_l < e_s \wedge$

d. $\exists p^{cs} \wedge p^{cs} = p$

It should be clear by now how the proposed semantics captures the different parts of the current account. Let us take (20) as an illustration. Due to the interpretation rule in (17), the regular assertive content represented in (20b) will hold in each world of the scope proposition, hence the latter will be entailed, if accepted. Since the evidential contribution (20c) is separated from the contribution of the rest of the sentence, it will project.[21] The evidential import will also be backgrounded since it is directly predicated of the context set, not of the scope proposition representing the new proposal. Finally, all the temporal information is recorded in (20), as already explained in (10)-(11) above.

6 Extensions to non-past tenses

So far the temporal account of Bulgarian evidentials was only discussed with respect to past tense sentences. In this section I suggest how it could be extended to sentences in non-past tenses.

I first discuss sentences in the future tense. Future tense sentences have their topic time later than the speech event. Since the learning event always precedes the speech event (see Section 4), the learning event will necessarily precede the topic time. This would predict that future sentences are only possible with direct evidentials. However, future sentences with indirect evidentials are perfectly natural in Bulgarian. Hence, the original account needs to be modified in order to accommodate such data.

A tentative idea would be that evidential markers in Bulgarian can only target *past* times, i.e. times that precede the speech event. When the topic time is non-past,

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21 Negation, as defined in Groenendijk & Stokhof (1991), introduces certain complexities. It interacts with the definition in (17) in such a way that it only requires that the lexical relation does not hold in *some* of the context-set worlds, not in all such worlds. One solution would be to introduce the positive proposition first and relativize foregrounded content to it; the scope proposition would then be the set-theoretic difference between the context set and the positive proposition. For a different implementation of the same idea, see Murray (2010), who builds on Bittner (2010).

evidentials will target another topical past time, typically some salient stages of the preparatory process of the verbal event.[22] This could include the physical signs of an upcoming event or someone's decision to undertake a certain action. The latter case is illustrated below. The speaker has reportative evidence for her claim in both (21) and (22). What is different is the temporal location of Daniela's decision to visit Georgi tomorrow: simultaneously with the time of learning (21) or prior to it (22).

(21)   Daniela discusses her plans for tomorrow with you. While talking to you she decides to visit Georgi. You say:

      *Utre   Daniela šte-Ø   / ??štja-**l**-a   da poset-i Georgi.*
      tomorrow Daniela will-**DIR** / will-**IND**-FEM PRT visit-3SG Georgi

      'Tomorrow Daniela will visit Georgi. She decided it while talking to me.'

(22)   A few days ago Daniela decides to visit Georgi tomorrow. Today, she informs you about her plans. You say:

      *Utre   Daniela ??šte-Ø / štja-**l**-a   da poset-i Georgi.*
      tomorrow Daniela will-**DIR** / will-**IND**-FEM PRT visit-3SG Georgi

      'Tomorrow Daniela will visit Georgi, she told me.'

If the learning event targets Daniela's decision to visit Georgi, then the use of the evidential markers above is predicted.

Evidentials in Bulgarian can also occur in present tense sentences. Morphologically, present tense sentences are only compatible with imperfective verbs. I assume that in such cases evidentials target some salient stages of the ongoing eventuality. In (23), the learning event overlaps with the stages of the rain observed by the speaker and only DIR is possible. In (24), the learning event follows the salient stages of the rain (which overlap with the learning event of the speaker's friend) and IND is strongly preferred.

(23)   You are in Sofia. You look through the window and see the pouring rain. You say:

      *V moment-a   v Sofia val-i-Ø   / #val-ja-**l**-o.*
      in moment-DEF in Sofia rain-3SG-**DIR** / rain-3SC-**IND**-NEUT

      'Right now it is raining in Sofia, I noticed.'

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22 I assume the event structure of Moens & Steedman (1988) and Kamp & Reyle (1993), who distinguish between preparatory process/phase, culmination (point), and consequent/result state.

(24)   A friend of yours gives you a call from Sofia and tells you that it is raining there. You say:

V moment-a   v Sofia ??val-i-Ø   / val-ja-l-o.
in moment-DEF in Sofia rain-3SG-**DIR** / rain-3SG-**IND**-NEUT

'Right now it is raining in Sofia, someone noticed.'

The data above are explained by the assumption that the learning event targets the stages of the rain observed by the source of the information, either the speaker herself (23) or the speaker's friend (24).

There are languages with temporal-like indirect evidentials that differ from Bulgarian in that they are only used with past tenses, e.g. Cuzco Quechua (Faller 2004). It is possible that such languages also introduce learning events but such events always target the topic time, even when the latter is non-past.

7   Conclusion and outlook

In this paper I have argued that Bulgarian evidentials entail the scope proposition, represent projective content/backgrounded assertions, and encode the temporal distance between the time of learning of the scope proposition and the topic time. I also suggested how the current account can be extended to sentences with evidentials in non-past tenses. In the remaining part of this conclusion I explore some of the broader implications for the theory of evidentiality and other domains of linguistics.

With respect to the speaker's commitment to the scope proposition, a new type of (indirect) evidentials seems to emerge. First, there is the class of *illocutionary-like* evidentials which imply no commitments to the scope proposition. Examples include *-si* in Cuzco Quechua (Faller 2002, Faller 2011), *-sėstse* in Cheyenne (Murray 2010), and *soo-da* in Japanese (McCready & Ogata 2007). In addition, there is the class of *modal-like* evidentials. Such evidentials imply some degree of uncertainty of the speaker with respect to the scope proposition. It has been argued in that *sollen* in German (Faller 2006) and *-ku7* in St'át'imcets' (Matthewson et al. 2007) are modal-like evidentials. Next to those two well-known classes, there seems to emerge a third class of evidentials, i.e. evidentials that commit the speaker to the scope proposition. I will simply call such evidentials 'temporal-like' evidentials. Some examples of temporal-like evidentials are *-red* in Tibetan (Garrett 2001) and, on the current analysis, *-l* in Bulgarian. It is an open question to what extent the property of being a temporal evidential is cross-linguistically correlated with the property of entailing the scope proposition.

Another point concerns some configurational similarities across grammatical

domains.[23] Reichenbach (1947) famously distinguished between three times in the temporal ontology of English: a *speech point* (the time of utterance), an *event point* (the time during which the verbal eventuality holds), and a *reference point* (roughly, my topic time from above). Stone (1997) argues that the same tripartite structure is found in the modal domain of English. Stone introduces three scenarios (or possibilities): a *speech scenario* (the current information of the speaker), an *event scenario* (the scenario described by the sentence), and a *reference scenario* (some contextually salient scenario) and directly links these to the speech point, the event point, and the reference point, respectively. If the analysis presented above is on the right track, there are three events involved in the eventuality system of Bulgarian and, possibly, various other typologically unrelated languages: a speech event (the event of the speaker uttering the sentence), a verbal event (the event described by the verb phrase), and a learning event (the event of the speaker's learning the scope proposition). The way these events are linked to the three temporal points introduced by Reichenbach was already described above.

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23 Speas (2010) makes a similar point.

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